

(PWSNO 1280192)  
**TWINLOW RESIDENTS DEEP WELL ASSOCIATION)**  
**SOURCE WATER ASSESSMENT REPORT**

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**January 16, 2002**



**State of Idaho**  
**Department of Environmental Quality**

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## **SOURCE WATER ASSESSMENT FOR TWINLOW RESIDENTS DEEP WELL ASSOCIATION**

Under the Federal Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. The Idaho Department of Environmental Quality is completing the assessments for all Idaho public drinking water systems. The assessment for your particular drinking water source is based on a land use inventory within the well recharge zone, your water quality history, construction characteristics of your well or wells, and site specific sensitivity factors associated with the aquifer your water is drawn from.

This report, *Source Water Assessment for Twinlow Residents Deep Well Association* describes the public drinking water source, potential contaminant sites located within in the well recharge boundaries, and the susceptibility (risk) that may be associated with any associated potential contaminants. DEQ used a refined computer model approved by the EPA to map the boundaries of the well recharge area into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for systems drawing from the Rathdrum Prairie Aquifer. The computer model used data assimilated by DEQ from a variety of sources including local well logs.

This assessment, taken into account with local knowledge and concerns, should be used as a planning tool to develop and implement appropriate protection measures for this system. **The results should not be used as an absolute measure of risk and are not intended to undermine the confidence in your water system.**

**Potential Contaminant Inventory.** The Twinlow Residents Deep Well Association public water system serves 23 connections for a seasonal camp and 3 year round residences located on Lower Twin Lake between Rathdrum and Spirit Lake, Idaho. Maximum occupancy of the camp is about 170 people. The recharge zone for the well is a narrow corridor encompassing about 2.4 acres and stretching westward from the well to the edge of the Rathdrum Prairie Aquifer defined by Lower Twin Lake. The estimated time of travel from the edge of the aquifer to the well is one year or less.

There are no potential contaminant sources documented inside the well recharge zone other than surface waters of the lake. An on-site inspection in April 1999 determined that Lower Twin Lake does not directly influence the well, so it was not counted as a potential contaminant source in the assessment of the well's susceptibility to contamination. The location relative to the well of septic systems serving the camp and homes in the recharge zone is not known.

**Water Quality History.** Twinlow Residents Deep Well Association, under regulation as a non-community transient public water system, is required to monitor quarterly for bacterial contamination. Bacteria were present in several distribution system samples in 2001, the summer of 2000, the winters of 1996-1998 and in 1993 and 1994.

A sanitary survey August 9, 2001, noted that the most likely source of recurrent bacterial contamination was faulty disinfection following repairs to waterlines serving the camp. The inspection also found the area under the pump house floor and around the well had collapsed, compromising the well seal.

Nitrate samples drawn in 1985, 1988, 1993, 1997 and 1998 show concentrations ranging between undetectable levels and 0.36 mg/l. The Maximum Contaminant Level (MCL) for nitrate is 10 mg/l. Transient water systems like Twinlow are required to test annually for nitrate.

**Well Construction.** The Twinlow Residents Deep Well Association well was constructed sometime in the 1930s. The well was partially dug, then drilled to completion. It has a 6-inch steel casing. A 1977 Report of Water Supply in the public water system file for Twinlow gives the depth of the well as 365 feet with the static water level at 340 feet below the surface. A Sanitary Survey dated May 3, 1999 reports the depth of the well at 230 feet. No well log is on file with DEQ, so many construction features used to assess vulnerability to contamination are unknown. The well is in a pit with the well head below grade. Current Idaho Department of Water Resources (IDWR) standards and Idaho Department of Environmental Quality rules for public drinking water systems forbid the location of a drinking water well in a pit. There is a 6-inch pipe at the bottom of the pit that drains to daylight, providing protection from flooding.

**Well Site Characteristics.** Soils in the well recharge zone are generally well drained. Well-drained soils provide little protection against migration of contaminants toward the well. The soil structure above the water table at the well site is unknown.

**Susceptibility to Contamination.** A susceptibility analysis of the Twinlow Residents Deep Well Association well, incorporating information from the public water system file and the potential contaminant inventory, ranked the well moderately susceptible to all classes of regulated contaminants. While many risk factors weighed in the system construction and hydrologic sensitivity portions of the analysis are unknown because there is no well log, scores for the Twinlow well are in line with scores for other wells on the Rathdrum Prairie Aquifer. The susceptibility analysis worksheet for your well on page 6 of this report shows how your well was scored. Formulas used to compute the final susceptibility scores are at the bottom of the worksheet.

**Source Water Protection.** This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

The 186 public water systems in Idaho that draw water from the Rathdrum Prairie Aquifer should consider forming a regional group to represent their interests before state, county and municipal governing bodies when regulatory tools like zoning overlays, or enactment of building codes are the most appropriate ground water protection measures.

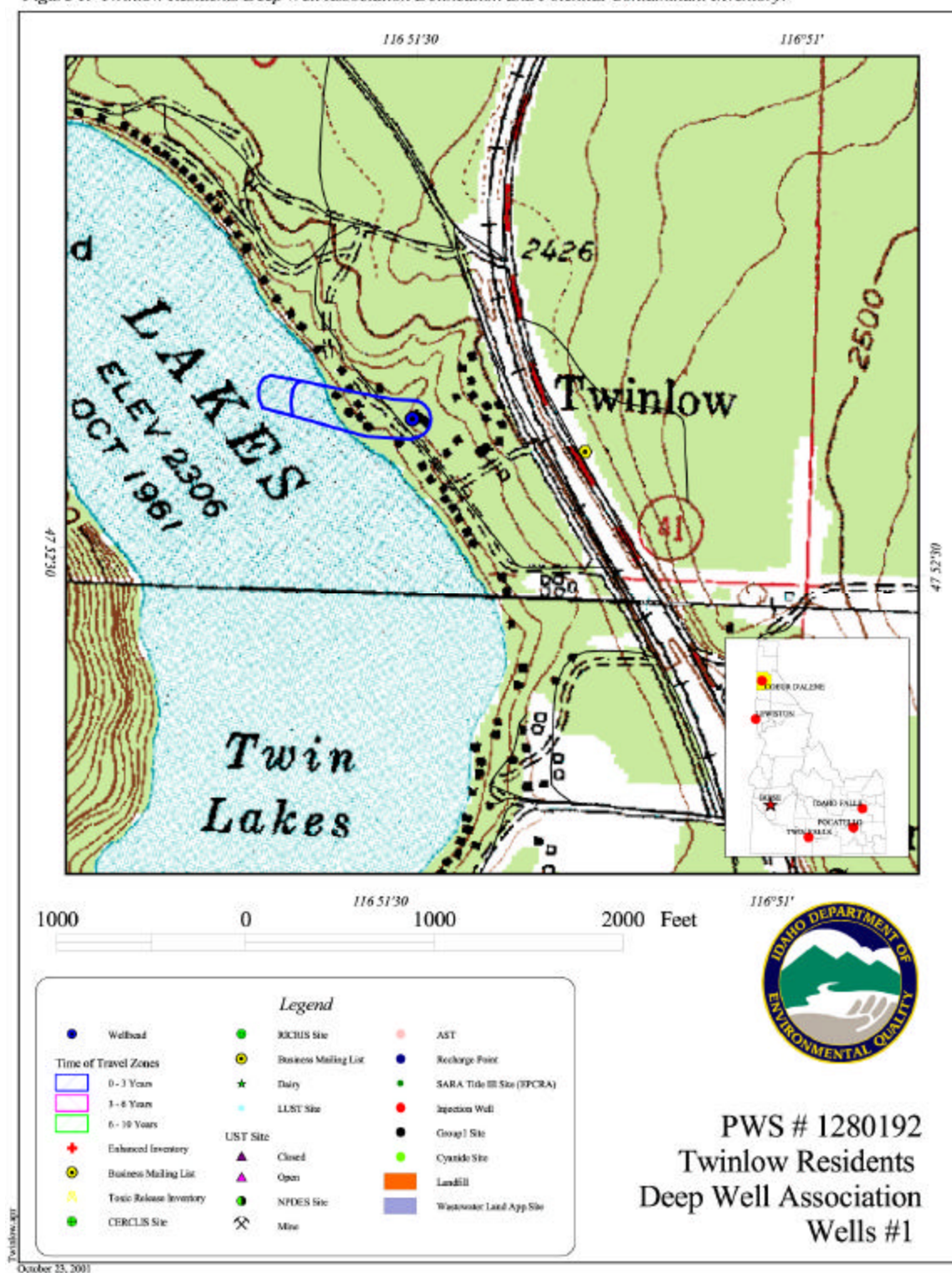
The goal of source water protection is to maintain current water quality for the future despite the changes we can expect with population growth in North Idaho

Drinking water protection activities for Twinlow Residents Deep Well Association should focus first on extending the well casing so it stands at least 18 inches above grade, repairing the settling problem around the well and reinstalling the surface seal. Breaks in the well seal provide a direct conduit to the aquifer for surface contaminants. System operator Bob Jester said recommended concrete work was underway in January 2002. Recurrent bacterial contamination problems are apparently due to waterline repairs and extensions at the adjoining church camp and leaks in the reservoir. The water system is working closely with the camp and has stepped up bacterial monitoring to keep abreast of the situation.

Twinlow Residents Deep Well Association is fortunate because it has direct jurisdiction over most of the recharge zone for its well. No herbicides, pesticides or fertilizers should be used or stored within 50 feet of the well, and should be used sparingly in the recharge zone shown on the map accompanying this report. The Association should encourage homeowners in the recharge zone to monitor their septic systems for signs of failure such as odor or lush vegetation, and to participate in other ground water protection activities.

Additional ideas for ground water protection are available on the DEQ website, <http://www.deq.state.id.us>. If you would like help in developing a drinking water protection plan please telephone the Coeur d'Alene Regional Office of DEQ at 208 769-1422.

Figure 1. Twinlow Residents Deep Well Association Delineation and Potential Contaminant Inventory.



# Attachment A

## Twinlow Residents Deep Well Association Susceptibility Analysis Worksheet

## Ground Water Susceptibility

Public Water System Name : **TWINLOW RESIDENTS DEEP WELL** Well # : **WELL #1**  
 Public Water System Number : **1280192** 10/23/01 2:43:45 PM

1. System Construction		SCORE			
Drill Date	1930s				
Driller Log Available	NO				
Sanitary Survey (if yes, indicate date of last survey)	YES 2001				
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	NO	1			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
<b>Total System Construction Score</b>		<b>5</b>			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
<b>Total Hydrologic Score</b>		<b>6</b>			
3. Potential Contaminant / Land Use - ZONE 1A		IOC	VOC	SOC	Microbial
		Score	Score	Score	Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
<b>Total Potential Contaminant Source/Land Use Score - Zone 1A</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2 ) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
<b>Total Potential Contaminant Source / Land Use Score - Zone 1B</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Cumulative Potential Contaminant / Land Use Score</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>4. Final Susceptibility Source Score</b>		<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>
<b>5. Final Well Ranking</b>		Moderate	Moderate	Moderate	Moderate

The final scores for the susceptibility analysis were determined using the following formulas:

- VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.27)
- Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

**Final Susceptibility Ranking:** 0 - 5 Low Susceptibility; 6 - 12 Moderate Susceptibility; > 13 High Susceptibility.

## POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.